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**User's Guide to the ARI-NTC  
Mission Databases**  
(Revised for 90-01 forward databases)

**Jack D. Baldwin**

BDM International, Inc.

for

**Contracting Officer's Representative**  
**Michael R. McCluskey**

**Field Unit at Presidio of Monterey**  
**Howard H. McFann, Chief**

**Training Research Laboratory**  
**Jack H. Hiller, Director**

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<p>This report demonstrates the use of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) mission databases for the National Training Center at Fort Irwin, CA. It has a general discussion of the types of data that are included in the databases, as well as general principles of variable naming.</p> <p>The text also contains a series of examples that use the INGRES query language to extract, categorize, and summarize data contained in the databases. It is intended as a learning guide for users of the database who wish to construct their own set of database queries associated with specific research requirements.</p>			
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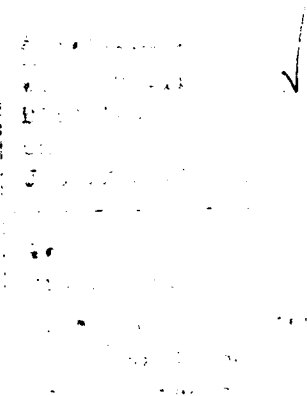
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# USER'S GUIDE TO THE ARI-NTC MISSION DATABASES

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## USER'S GUIDE TO THE ARI-NTC MISSION DATABASES

### 1.0 Purpose.

This document is intended for users of the ARI-NTC mission database. Its purpose is to familiarize the user with the current database structure and provide examples of INGRES queries for the researcher when doing analysis with the training data. These examples may help the reader understand how to construct their own queries once they have established an understanding of the mission databases. Appendix A contains a description of the NTC mission database formats. If the reader is not familiar with the structure and content of the mission databases, it would be of value for the reader to refer to them now, before working through the exercises.

We shall explore the principal linkages between the INGRES tables in the data base, that is the Player Identification Number (PID), Logical Player Number (LPN) and the Time of an event. It should be noted that our data bases are 'event driven', because all the entries in the Fire Event Table (FET), the Pairing Event Table (PET), and the Indirect Fire Missions Fired (IFMF) result from actions initiated in the training exercise.

It is our desire to provide a template for use when the researcher designs a plan of analysis for a specific research issue. It is assumed that the reader will be familiar with using 'iquel' (an INGRES utility for interactive use of a database) and have a knowledge of the particular training rotation they wish to investigate ('iquel' is discussed in Ingres Release 5.0 for the VMS operating system Volume I, Ingres Menu Users Guide, Chapter 7 of the INGRES Reference manuals).

### 2.0 Gaining access to ARI databases.

If you are new to ARI-POM, and do not have your own computer account on our VAX 11/780 then see our R & D Coordinator for a user account and password. The login procedure is:

```
Username:XXXXXXXXX
Password:XXXXXXX
```

At the '\$' prompt, enter the following:

```
$ quel <mission.ing >mission.lis aridms
$ print mission/delete
```

These commands will print a catalogue of the mission databases for your reference. (Output is at the system line printer.)

```
l> print mission
mission table
```

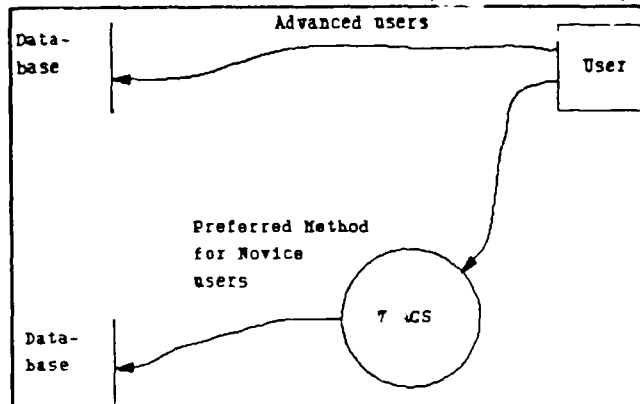
mstart	mend	mhisto	mseg	mtype	msubtype	morg	mtf	mdbname
03-Dec-89 06:50:00	03-Dec-89 07:30:00	9003A0	15	Hasty Attack	Mvmt/Mnvr	1-008 X 1-032	C	N903c_03
03-Dec-89 07:30:01	03-Dec-89 09:10:00	9003A0	15	Hasty Attack	Objective	1-008 X 1-032	C	N903c_03
01-Dec-89 17:02:12	01-Dec-89 18:54:16	9003A0	9	Defend	Ctr-Recon	1-008 X 1-032	C	N903c_02
01-Dec-89 20:03:21	02-Dec-89 02:06:31	9003A0	10	Defend	Ctr-Recon	1-008 X 1-032	C	N903c_02
02-Dec-89 03:19:53	02-Dec-89 05:15:16	9003A0	11	Defend	Ctr-Recon	1-008 X 1-032	C	N903c_02

Any of the databases listed may be accessed by entering the following command from the monitor:

```
$ iquel dbname
```

where dbname is a valid database name from the catalogue listing.

A second, and simpler method of accessing the mission databases is to use the Training Research Automated Catalog System (TRACS). (See Figure 1.) Any and all missions can be queried through the TRACS system, and the user has the added functionality of knowing what type of mission, the type of data used to create it, terrain information, equipment used and a number of other selection criteria about the database. See TRACS User's Manual for further information about the program and the selection criteria available to the researcher.



**Figure 1** Methods of accessing Mission Databases.

### 3.0 The Player: PID and LPN

We begin our discussion with an explanation of the player identification number, the PID. (Note here that the title 'player' actually refers to a specific tank crew, a TOW squad or a squad in an armored personnel carrier). It is a three character acronym for a player's company and platoon. Consider the player name 'A13'; The first character is alphabetic, and therefore we may assume the player belongs to 'A' company. If the player name were designated as '13A', we can be led to believe that the player is from a different battalion (i.e. a cross attached unit). The position within the name of the alpha character describes that player's task force association. The '1' in A13 describes the players platoon. The '3' identifies the squad within the platoon. With this information, we see that 'A13' stands for 'A' company, first platoon, third squad.

The rules are:

```
for indigenous task force - A13
                        A = company
```

1 = platoon  
3 = squad  
for cross attached units - 13A  
1 = platoon  
3 = squad  
A = company

There are a number of notable exceptions to the above rules, which will be addressed now. Leaders will have a six in their name as in H66 (battalion commander), H65 (second in charge), B66 (B company commander), B65 (B company second in charge) and so on. Scout teams are given a name beginning with 'SC' and then a numeric digit to distinguish between squads (SC1, SC2, etc.). Anti-tank squads (using TOWs) are given names beginning with an 'E'. A partial list of anti-tank player names would be E11, E12, and so forth. Player identifications are not unique, as both Opfor and Bluefor players can have the same PID (as in H66, the commander of each force). In order to uniquely determine a player, we use the Logical Player Number or LPN, which is the player's sequence number in the Player State Initialization Table (PSIT). Each player in the PSIT is assigned a unique sequence number, and can be tracked with this number throughout the mission.

#### 4.0 The Tables: Event data vs. Static data.

Lets begin our discussion here with a distinction between 'event' and 'static' data. Events are those data that occurred in the field of play, such as a main gun round being fired. Think of them as 'what's going on' during a training mission. Static data defines the condition of the field and players during a training mission. Think of static data as 'what it looks like'. We will now expand on these concepts.

A good rule of thumb for recognizing an 'event' table is the presence of a time variable. In our database, the following tables have a time stamp with each event:

1) Fire Event Table	(FET)
2) Pairing Event Table	(PET)
3) Indirect Fire Missions Fired	(IFMF)
4) Indirect Fire Casualties Table	(IFCT)
5) Minefield Casualties Table	(MCT)
6) Communications Table	(CT)
7) Ground Player Location Table	(GLPT)
8) Air Player Location Table	(APLT)
9) Player State Update Table	(PSUT)
10) Unit State Update Table	(USUT)
11) Control Measure	(CM)

All of the above tables can be linked logically by their time variable, and can give us a chronological view of the training exercise.

Static tables support the event tables. They contain the condition and or state of the troops at the start of the training



exercise. The following is a list of the database's static tables:

1) Player State Initialization Table	(PSIT)
2) Unit State Initialization Table	(USIT)
3) Unit Type Table	(UTT)
4) Player Vehicle Weapon Table	(PVWT)
5) Indirect Fire Target Table	(IFTT)
6) Indirect Fire Group Table	(IFGT)
7) Control Measure Table	(CMT)

These tables help give the researcher an idea of the physical condition of the players and the battlefield during the training mission.

With a better understanding of Event and Static table types, let us now investigate how the researcher can utilize the information in the different tables to their advantage. We will begin with some elementary examples of querying the database and progress to move complex techniques.

For a first example, let us determine the side (Opfor or Bluefor) of a firee (person being fired at) in the PET. We will need to look at the LPN of the firee in the PET and match it to the LPN in the PSIT (See Appendix A for a description of the variables within each database table).

Examples: The Pairing Event Table.

4.1 The Pairing Event Table (PET) is considered to be the heart of the NTC research database. It is where the direct fire assessments are recorded on a player by player basis. Our first set of query examples will center around using the PET. We hope that these examples will provide a useful guideline for researchers.

Example one merely matches the PET to the PSIT using the firees' logical player number as the thread between the two tables.

#### **Example One: Finding the Force Code of the Firee**

QUEL COMMANDS: \_\_\_\_\_

```
1> /* PET example # 1: Finding the force code of the firee (target) */
2> range of p is PET /* Pairing Event Table */

1> range of q is PSIT /* Player State Initialization Table */

1> retrieve (p.time,p.tpid,p.result,q.side)
2> where p.tlpn = q.lpn /* match on logical player number */
3> sort by p.time /* maintain chronological order */
```

time	tpid	result	side
30-Nov-89 07:33:32	C33	H	B
30-Nov-89 07:35:19	FD2	N	B
30-Nov-89 07:35:48	D50	N	B
30-Nov-89 07:39:47	C66	N	O
30-Nov-89 07:41:46	31A	N	B
30-Nov-89 07:43:45	60A	H	B
30-Nov-89 07:43:53	B34	H	B
30-Nov-89 07:44:18	B34	N	B
30-Nov-89 07:44:30	D24	N	B
30-Nov-89 07:46:45	A16	N	O
30-Nov-89 07:47:45	A65	H	O
30-Nov-89 07:52:15	23B	K	B
30-Nov-89 07:54:34	B60	K	B
30-Nov-89 07:55:59	330	N	O
30-Nov-89 07:56:32	313	H	O
o			
o			
o			
30-Nov-89 10:21:13	433	H	O
30-Nov-89 10:21:18	433	H	O
30-Nov-89 10:24:38	C13	N	B

(287 rows)  
End of Request

The fields that are displayed are in the same order as they appear in the 'RETRIEVE' statement of the query. 'Time' refers to the time of the pairing event. 'TPID' is the targets player identification (the firee). 'RESULT' is the outcome of the engagement (H - hit, K - kill, N - near miss). 'SIDE' is the force code of the firee.

The last line of the query is a sort directive, which keeps the data in the same order as it occurred during the training exercise.

4.2. The next example builds upon the first in that we've added a third table to our query. We have used a technique called 'pivoting', which uses the PSIT to point to a third table. The following diagram for example two may help visualize this concept.

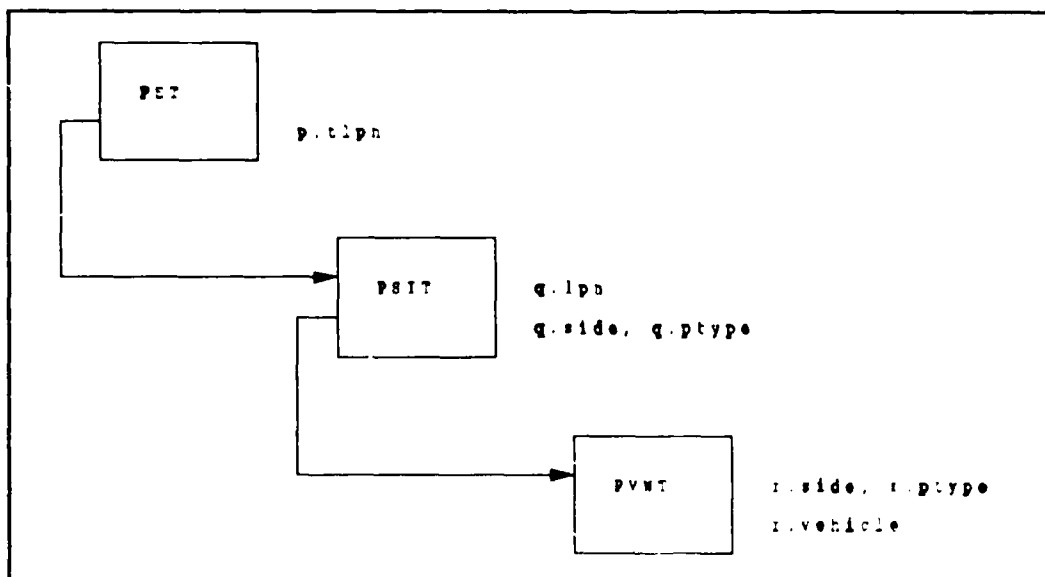


Diagram of example #2.

### Example Two: Finding the Vehicle Type of the Firee.

#### QUEL COMMANDS:

```

1> /* PET example # 2: Finding vehicle type of firee using the */
2> /* PVWT (Player Vehicle Weapon Table) */
3> /* Note: some player types have more than one vehicle for a */
4> /* given side/ptype combination. The miles code in the PVWT*/
5> /* can be used to qualify a singular vehicle in these cases.*/
6> /* */
7> range of p is PET /* Pairing Event Table */

1> range of q is PSIT /* Player State Initialization Table */

1> range of r is PVWT /* Player Vehicle Weapon Table */

1> retrieve (p.time,p.tpid,p.result,q.side,r.vehicle)
2> where p.tlpn = q.lpn /* match on logical player number */
3> and q.side = r.side /* match on player force code */
4> and q.ptype = r.ptype /* match on player vehicle type */
5> sort by p.time /* maintain chronological order */

```

time	tpid	result	side	vehicle
30-Nov-89 07:32:47	621	H	O	BRDM
30-Nov-89 07:33:32	C33	H	B	M60 A1/A3 Tank
30-Nov-89 07:35:19	FD2	N	B	Mortar
30-Nov-89 07:35:48	D50	N	B	M60 A1/A3 Tank
30-Nov-89 07:39:47	C66	N	O	Tank (T-72)
30-Nov-89 07:41:46	31A	N	B	Bradley
30-Nov-89 07:43:45	60A	H	B	Bradley
30-Nov-89 07:44:18	34	N	B	M60 A1/A3 Tank

30-Nov-89	07:44:30	D24	N	B	M60 A1/A3 Tank
30-Nov-89	07:46:45	A16	N	O	Tank (T-72)
30-Nov-89	07:47:45	A65	H	O	Tank (T-72)
O					
O					
O					
30-Nov-89	07:52:15	D23B	K	B	Bradley
30-Nov-89	07:54:34	E60	K	B	M60 A1/A3 Tank
30-Nov-89	07:55:59	330	N	O	BMP
30-Nov-89	07:56:32	313	H	O	BMP

-----+-----+-----+-----+-----+-----+  
(381 rows)  
End of Request

The last field, 'vehicle', comes from the PVWT and identifies the target vehicle's type.

4.3 Example three turns our attention to the firer, the player who pulled the trigger to cause the pairing. Because the NTC uses the MILES laser system for simulating engagements, many times the firer is unknown to the CIS computers. This is reflected in the data, as only approximately twenty percent of the pairing events have a known firer. When the firer is known, his LPN is recorded in the field 'flpn' of the PET, otherwise the flpn is zero. We can use this fact to find those 'matched' pairing events in the PET. Example three is similar to example one, except now we seek information about the firer.

### Example Three: Finding Rows Where the Firer is Known

QUEL COMMANDS:

```

1> /* PET example # 3: Finding rows where the firer is known */
2> range of p is PET /* Pairing Event Table */

1> range of q is PSIT /* Player State Initialization Table */

1> retrieve (p.time,p.fpid,p.result,q.side)
2> where p.flpn = q.lpn /* match on logical player # (firer) */
3> and p.flpn > 0 /* firers lpn is non zero */
4> sort by p.time /* maintain chronological order */

```

time	fpid	result	side
30-Nov-89 07:52:15	B34	K	B
30-Nov-89 08:06:59	C12	H	B
30-Nov-89 08:16:01	D33	N	B
30-Nov-89 08:21:32	D23	N	B
30-Nov-89 08:21:58	D23	K	B
30-Nov-89 08:22:03	C13	K	O
30-Nov-89 08:34:01	C33	N	B
30-Nov-89 08:34:26	C33	N	B
30-Nov-89 08:56:47	C12	K	B

```
| 30-Nov-89 08:57:58 |A65   |H     |O     |
+-----+-----+-----+
(10 rows)
End of Request
```

4.4 For the sake of completeness, example four parallels example two, again with the exception that we are investigating the firer. The three table query lists another variable in the PVWT, the firer's weapon as defined by the MILES code in the PET and translated by the PVWT.

#### Example Four: Finding Rows Where the Firer is Known

QUEL COMMANDS:

```
1> /* PET example # 4: Finding rows where the firer is known and*/
2> /* determine the firer's vehicle and weapon types. */
3> /* Note: here we can determine the side/ptype/miles of firer */
4> /* and thus we can make a unique match in the PVWT */
5> /* */
6> range of p is PET /* Pairing Event Table */

1> range of q is PSIT /* Player State Initialization Table */

1> range of r is PVWT /* Player Vehicle Weapon Table */

1> retrieve (p.time,p.fpid,p.result,q.side,r.vehicle,r.miles)
2> where p.flpn = q.lpn /* match on logical player # (firer) */
3> and q.side = r.side /* match on force codes */
4> and q.ptype = r.ptype /* match on player type codes */
5> and p.miles = r.miles /* match on weapon codes */
6> and p.flpn > 0 /* firers lpn is non zero */
7> sort by p.time /* maintain chronological order */
```

```
+-----+-----+-----+-----+-----+
|time           |fpid |result|side |vehicle           |miles |
+-----+-----+-----+-----+-----+
| 30-Nov-89 07:52:15 |B34  |K     |B    |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:06:59 |C12  |H     |B    |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:16:01 |D33  |N     |B    |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:21:32 |D23  |N     |B    |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:21:58 |D23  |K     |B    |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:22:03 |C13  |K     |O    |Tank (T-72)    | 10|
| 30-Nov-89 08:34:01 |C33  |N     |B    |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:34:26 |C33  |N     |B    |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:56:47 |C12  |K     |B    |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:57:58 |A65  |H     |O    |Tank (T-72)    | 10|
+-----+-----+-----+-----+-----+
(10 rows)
End of Request
```

4.5 In our last example using the PET, we use a technique that allows us to look up both the firer and firee in the same query.

It may not be obvious to the researcher, but there is only one LPN field in the PSIT, yet both the firer and firee have LPN's in matched pairings in the PET.

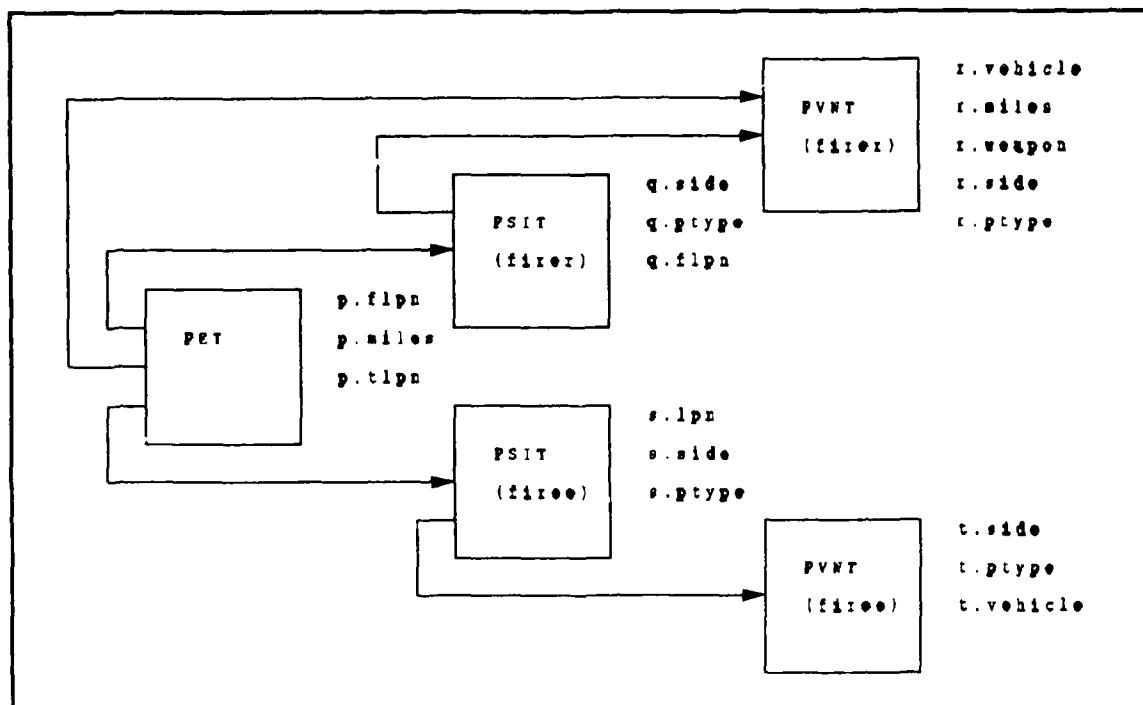


Diagram of Example #5.

#### Example Five: Combining the Queries in Examples 1-4.

QUEL COMMANDS:

```

1> /* PET example # 5: Combining the queries in examples 1 through */
2> /* 4 we come up with a complete picture of the engagement */
3> /* */
4> range of p is PET /* Pairing Event Table */

1> range of q is PSIT /* copy for the firer relationships */
1> range of r is PVWT /* copy for the firer relationships */
1> range of s is PSIT /* copy for the firee relationships */
1> range of t is PVWT /* copy for the firee relationships */

1> retrieve (p.time,p.tpid,s.side,t.vehicle,p.fpid,p.result,q.side,
2> r.vehicle,r.miles)
3> where p.flpn = q.flpn /* match on logical player # (firer) */
4> and q.side = r.side /* match on force codes (firer) */
5> and q.ptype = r.ptype /* match on player type (firer) */
6> and p.miles = r.miles /* match on weapon codes (firer) */
7> and p.flpn > 0 /* firers lpn is greater than zero*/
8> and p.tlfn = s.lpn /* match logical player # (firee) */

```

```

9>      and s.side = t.side      /* match on force codes (firee) */
10>     and s.ptype = t.ptype    /* match player type codes (firee) */
11>     and p.frat = "N"         /* omit fratricides */
12>     sort by p.time           /* maintain chronological order */

```

```

+-----+-----+-----+-----+-----+-----+-----+
|time      |tnid|side|vehicle      |fpid|result|side|vehicle      |miles|
+-----+-----+-----+-----+-----+-----+-----+
| 30-Nov-89 08:06:59 |C65 |O   |Tank (T-72)   |C12 |H      |B   |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:16:01 |C35 |O   |Tank (T-72)   |D33 |N      |B   |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:21:32 |C23 |O   |Tank (T-72)   |D23 |N      |B   |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:21:58 |C23 |O   |Tank (T-72)   |D23 |K      |B   |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:22:03 |12A |B   |Bradley       |C13 |K      |O   |Tank (T-72)    | 10|
| 30-Nov-89 08:34:01 |327 |O   |BMP           |C33 |N      |B   |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:34:26 |762 |O   |BMP           |C33 |N      |B   |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:56:47 |A16 |O   |Tank (T-72)   |C12 |K      |B   |M60 A1/A3 Tank | 12|
| 30-Nov-89 08:57:58 |C12 |B   |Abrams        |A65 |H      |O   |Tank (T-72)    | 10|
| 30-Nov-89 08:57:58 |C12 |B   |M60 A1/A3 Tank |A65 |H      |O   |Tank (T-72)    | 10|
+-----+-----+-----+-----+-----+-----+-----+

```

(10 rows)

End of Request

4.6 Now let us look at some other tables in our research database. Indirect fire casualties are recorded in the IFCT, and the firing unit is recorded in the Indirect Fire Missions Fired table (the IFMF). This is analogous to the relationship between the Pairing Event Table (PET) and the Firing Event Table (the FET). Example six matches an indirect fire casualty with the firing battery and its force code. Note that there are few [and sometimes no] casualties reported by indirect fire.

#### Example Six: Matching Indirect Fire Casualties with Fire Mission.

QUEL COMMANDS:

```

1> /* Example # 6: Matching Indirect Fire Casualties with fire */
   /* mission. */
2> range of c is IFCT      /* Indirect Fire Casualty Table */

1> range of m is IFMF      /* Indirect Fire Missions Fired */

1> retrieve (c.time,c.side,c.pid,m.side,m.org)
2>   where c.fm = m.fm    /* match on fire mission numbers */
3>   sort by c.time       /* keep events in order */

```

```

+-----+-----+-----+-----+-----+
|time      |side |pid  |side |org      |
+-----+-----+-----+-----+-----+
| 30-Nov-89 09:03:25 |O     |314   |B     |4.2 inch |
+-----+-----+-----+-----+-----+

```

(1 row)

End of Request

4.7 Example seven adds to the previous example in that we also search the Indirect Fire Target Table (the IFTT) to locate any pre-planned target locations for the fire mission. We return the position of the target in the IFTT ('ifnum' is the sequence number of the target in the IFTT).

**Example Seven: Check to see if Indirect Fire Casualty was a Preplanned Target.**

QUEL COMMANDS \_\_\_\_\_

```
1> /* Example # 7: Check to see if indirect fire casualty */
2> /* of a pre-planned fire mission. */
3> /* */
4> range of c is IFCT /* Indirect Fire Casualty Table */

1> range of m is IFMF /* Indirect Fire Missions Fired */

1> range of t is IFTT /* Indirect Fire Target Table */

1> retrieve (c.time,c.side,c.pid,m.side,m.org,t.target)
2> where c.fm = m.fm /* match on fire mission number */
3> and m.target = t.target /* match on target name */
```

```
+-----+-----+-----+-----+-----+-----+
|time      |side |pid  |side |org      |target|
+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+
(0 rows)
End of Request
```

4.8 The last example shows an example of using some INGRES provided numerics function to compute the average engagement range, the number of engagements by weapon system, the minimum engagement range and the maximum engagement range for matched pairing events. Note the use of the "by" operator in the aggregate expression. Other numeric functions such as summation and trigometric functions are provided by INGRES and are described in Volume One of the INGRES manuals.

**Example Eight: Computing summary statistics.**

QUEL COMMANDS: \_\_\_\_\_

```
1> /* Example # 8: Computing some summary statistics for the BLUE */
2> /* and OPFOR forces. */
3> /* */
4> set aggregate noproject /* eliminate rows with zero */
1> range of q is PSIT /* Player State Initialization Table */
1> range of p is PET /* Pairing Event Table */
1> range of r is PVWT /* Player Vhicle Weapon Table */
1> retrieve (r.miles,r.weapon,r.vehicle,r.ptype,
2> avg_range = avg(p.distance by r.miles,r.ptype
3> where p.flpn > 0
```



```

4>             and p.flpn = q.lpn
5>             and q.side = r.side
6>             and q.ptype = r.ptype
7>             and p.miles = r.miles),
8>  sample_sz = count(p.distance by r.miles,r.ptype
9>                  where p.flpn > 0
10>                  and p.flpn = q.lpn
11>                  and q.side = r.side
12>                  and q.ptype = r.ptype
13>                  and p.miles = r.miles),
14>  min_range =   min(p.distance by r.miles,r.ptype
15>                  where p.flpn > 0
16>                  and p.flpn = q.lpn
17>                  and q.side = r.side
18>                  and q.ptype = r.ptype
19>                  and p.miles = r.miles),
20>  max_range =   max(p.distance by r.miles,r.ptype
21>                  where p.flpn > 0
22>                  and p.flpn = q.lpn
23>                  and q.side = r.side
24>                  and q.ptype = r.ptype
25>                  and p.miles = r.miles))

```

```

+-----+-----+-----+-----+-----+-----+-----+
|miles |weapon      |vehicle      |ltype |avg_range |sample_sz |min_ra|max_ra|
+-----+-----+-----+-----+-----+-----+-----+
|      3|Sagger      |BMP          |      3| 1353.333|      3| 1134| 1573|
|     10|125mm main gun|Tank (T-72)  |      1| 1198.714|      7|  195| 1768|
|     12|105mm main gun|M60 A1/A3 Tank|      1| 1740.324|     34|  833| 2973|
|     14|PKT (73mm)  |BMP          |      3|  454.000|      4|  249|  665|
|     21|125mm       |Bradley      |     29| 1703.000|      1| 1703| 1703|
+-----+-----+-----+-----+-----+-----+
(5 rows)

```

End of Request

Now, suppose we wished to collect this same data across multiple mission databases and perform summary statistics on them. We could use either a statistical package or a spreadsheet program on a microcomputer to help us get the data into a presentation form. First, we would need to output the data from one mission database into a file with a format acceptable to a statistical package or spreadsheet program, and then combine these files into a single file for input into our summary software. To do this, we use the Report Writer function of INGRES.

### USING REPORT WRITER TO CROSS MULTIPLE MISSION DATABASES

Note that the 'sort' option is removed from the query and placed with the report. The output file is defined with the '.OUT' statement and is called 'range.dat' in our example. The '.PRINT' line defines our output format and includes special characters used to delimit the fields of the records. Other delimiters may be used based on the needs of your summary software. The last command,

' .NL' tells the report writer to end each record with a new line character.

Two steps are needed to execute the above report. The first is to check the syntax of our report and install it in the necessary mission database:

```
$ sreport *dbname* filename.rw
```

where \*dbname\* is one of the mission database names and filename.rw is the name given to the file containing our report writer commands. The next step is to run the report, and that is done by the following:

```
$ report *dbname* range
```

where 'range' is the name given to the report on the '.NAME' line of the report definition. The output is a file named 'range.dat' in your current working directory. The file looks like this:

9003A0	,	4,MTC	,A,105mm main gun ,	815.00
9003A0	,	4,MTC	,A,105mm main gun ,	877.00
9003A0	,	4,MTC	,A,105mm main gun ,	948.00
9003A0	,	4,MTC	,A,105mm main gun ,	1510.00
9003A0	,	4,MTC	,A,105mm main gun ,	1513.00
9003A0	,	4,MTC	,A,105mm main gun ,	1513.00
9003A0	,	4,MTC	,A,105mm main gun ,	2143.00
9003A0	,	4,MTC	,A,125mm main gun ,	265.00
9003A0	,	4,MTC	,A,125mm main gun ,	1768.00

For each mission database that we apply the report against, we will get a file named range.dat;n where ;n refers to the version number assigned by the VMS monitor. To copy all of these files into one, issue the following command at the monitor:

```
$ copy range.dat;* allrange.dat
```

now, all of your data is in one file, allrange.dat, and it is ready to be used with SPSS (or another statistical package) or the spreadsheet of your choice on a microcomputer.

## **Appendix A - Mission Database Structure**

(Revised January 1990)

This Appendix documents the format of the NTC Mission Database. These databases include all relevant data from both NTC digital data sources, the CIS log and the RDMS log.

The CIS (Core Instrumentation Subsystem) is located on the VAX 11/780s. It consists of events gathered in the field, summaries of those events, the current state of units and players and the current battlefield conditions. This is the central 'brain' of the NTC instrumentation software, and the data archived from this software is the primary source of the Research databases. The structure of the mission databases is a reflection of the internal memory layout of the CIS.

The RDMS (Range Data Measurement System) log is the raw events coming out of the field from the players' Micro-B units. This is the data stream that feeds the CIS. We use this data (when available and in a usable format) to augment the CIS data. In particular, we use the miles event codes from weapon systems to enhance the PET (Pairing Event Table) data.

Each Mission Database contains 18 INGRES tables:

- ( 1) Mission Identification Table (MID),
- ( 2) Player State Initialization Table (PSIT),
- ( 3) Player State Update Table (PSUT),
- ( 4) Unit State Initialization Table (USIT),
- ( 5) Unit State Update Table (USUT),
- ( 6) Unit Type Table (UTT),
- ( 7) Player/ Vehicle/ Weapon Code Table (PVWT),
- ( 8) Firing Event Table (FET),
- ( 9) Pairing Event Table (PET),
- (10) Communication Table (CT),
- (11) Ground Player Position Location Table (GPLT),
- (12) Air Player Position Location Table (APLT),
- (13) IFCAS Target Table (IFTT),
- (14) IFCAS Target Group Table (IFGT),
- (15) IFCAS Missions Fired Table (IFMF),
- (16) IFCAS Casualties Table (IFCT),
- (17) Minefield Casualties Table (MCT),
- (18) Control Measure Table (CM)

The table types and their compositions were chosen to allow for the inclusion of the maximum amount of information in a format that will facilitate access for the kinds of research issues that have been defined to date. The table descriptions have been purposely kept as simple as possible to allow review of the structure and content without overwhelming the reviewer with reams of documentation. More complete element definitions are available in the Programmers' Guide to NTC Data, which provides a comprehensive guide to NTC digital data.

A rotation at the NTC is a three week period of time when a task force (Armored and Mechanized units) trains at Ft. Irwin, California. The rotation is divided into at least 2 histories, one each for the Armored unit and the Mechanized unit. Each History can have up to forty-eight segments in it, where a segment is a period of time when a specific mission is being conducted. These segments are After Action Reviews (AARs), battles such as Deliberate Attacks, Defend in Sector, Defend Battle Position and Movement to Contact, etc. Each Mission-level segment is a candidate for a unique research database.

A separate database is generated for each mission segment. The database name is an eight-character code constructed as follows:

Character 1 - For the mission databases derived from the National Training Center at Ft. Irwin, Ca, 'N'. For mission databases derived from data from the Joint Readiness Training Center at Ft. Chaffee, Ark. 'J'.

Characters 2,3 - Year of the Rotation.

Character 4 - A single hexadecimal digit representing the Rotation number. It ranges from 1 to E (for the fourteen rotations usually scheduled in a fisical year period)

Characters 5,6 - One of the following codes representing the type of task force:

A	Armor 1
R	Armor 2
M	Mech Inf 1
E	Mech Inf 2
I	Infantry 1
N	Infantry 2
C	Cavalry 1
V	Cavalry 2
T	Air Assault
L	Light / Ranger
S	Special Forces
AM	Armor / Mech
IM	Infantry / Mech
AC	Armor / Cavalry
ZA	More than 2 TF's
A	Armor 1
R	Armor 2
M	Mech Inf 1
E	Mech Inf 2
I	Infantry 1
N	Infantry 2
C	Cavalry 1
V	Cavalry 2
T	Air Assault
L	Light / Ranger
S	Special Force

Characters 7,8 - Day of the month of the exercise began on.

## A.2 Description of NTC Mission Database Tables

This section describes the contents of each table in the Mission Database. It includes the explicit layout, element by element, for each of the 18 tables.

### A.2.1 Mission Identification Table (MID)

The Mission ID table provides all information required to completely identify and categorize a mission segment.

Element Name	Element Description	Units
START TIME	Mission start date and time	20 Char
END TIME	Mission end date and time	20 Char
HISTORY	History Name	10 Char
SEGMENT	Segment Number	1 Integer
MTYPE <sup>1</sup>	Mission Type	20 Char
MSUBTYPE <sup>2</sup>	Mission sub type	10 Char
ORG	Unit ID	20 Char
TF	Task force type	1 Char
AIRPL	Air player P/L logging rate	2 Integer
GNDPL	Ground player P/L logging rate	2 Integer
DBNAME	Database name	10 Char

```
1> print mid
```

```
mid table
```

```
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|start_time|end_time|history|seg|mtime|msubtype|org|tf|air|gnd|dbname|
|-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|03-Dec-89 06:50:00|03-Dec-89 07:30:00|9003A0|15|Hasty Attack|Movement|1-008 X 1-032|C_|300|300|N903C_03|
|03-Dec-89 07:30:01|03-Dec-89 09:10:00|9003A0|15|Hasty Attack|Objective|1-008 X 1-032|C_|300|300|N903C_03|
|-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

```

### A.2.2 Player State Initialization Table (PSIT)

This table describes the player list at the beginning of the mission segment. It includes all players, Opfor, Bluefor, and White.

---

<sup>1</sup> The Mission Type will be Counterattack, Defend, Delay, Deliberate Attack, Hasty Attack, Hasty Defend, Movement to Contact, Night Attack, Night Derend, Raid, Search and Attack and Security.

<sup>2</sup> Sub mission types are: Recon, Ctr-Recon, Mvmt/Mnvr, Objective, Maneuver, Movement and MainBattle

Element Name	Element Description	Units
PID	Player identification (Bumper number)	3 Char
LPN <sup>3</sup>	Logical Player Number	2 Integer
SIDE	B(lue), O(pfor), or W(hite)	1 Char
INST	I(nstrumented) or N(ot instrumented)	1 Char
ACTIVE	0 - undetermined, 1 - Active, 2 - Not active	1 Integer
PTYPE	Player Type Code (See PVWT Table)	1 Integer
ORG	Next higher Line Unit	20 Char
TRACK	T(racked) or U(ntracked) by RDMS	1 Char
PSTAT <sup>4</sup>	Player Status Code	1 Integer

>range of p is psit

>retrieve (p.all) where p.side != "W" /\* don't look at controllers \*/

pid	lpn	side	inst	active	ptype	org	track	pstat
HQ1	32	O	I		0  3	TOC	T	1
HQ2	33	O	I		0  1	TOC	T	1
HQ3	34	O	I		0  3	TOC	T	1
HQ5	35	O	I		0  3	TOC	U	1
HQ6	36	O	I		0  3	TOC	U	1

### A.2.3 Player State Update Table (PSUT)

The Player State Update table tracks changes to all players throughout the duration of the mission segment. Fields that are subject to update are SIDE, INST, PTYPE, ORG, TRACK and PSTAT.

Element Name	Element Description	Units
TIME	Date and Time of Update	20 Char
PID	Player identification (Bumper number)	3 Char
LPN	Logical Player Number	2 Integer
SIDE	B(lue), O(pfor), or W(hite)	1 Char
INST	I(nstrumented) or N(ot instrumented)	1 Char
PTYPE	Vehicle Type Code (See PVWT Table)	1 Integer
ORG	Next higher Line Unit	20 Char
TRACK	T(racked) or U(ntracked) by RDMS	1 Char
PSTAT <sup>3</sup>	Player Status Code	1 Integer

<sup>3</sup> The Logical Player Number (LPN) is a unique index used by the realtime system.

<sup>4</sup> The player status codes are :

- |                         |                       |
|-------------------------|-----------------------|
| 1 : Operational         | 2 : Combat Loss       |
| 3 : OC Gun Kill         | 4 : Accidental Kill   |
| 5 : Administrative Kill | 6 : Mechanically Down |
| 7 : Mobility Kill       |                       |

>range of p is psut  
>retrieve (p.all)

time	pid	lpn	side	inst	ptype	org	track	pstat
05 Feb 88 03:11:25	DMT	356	B	I	2	CP/D/D/2-005	T	1
05 Feb 88 03:11:27	DEV	303	B	I	2	CBT/2-005	U	5
05 Feb 88 03:12:27	21H	4	W	I	2	No unit	U	9
05 Feb 88 03:12:41	433	128	O	I	3	3/3-001	T	2
05 Feb 88 03:13:40	21S	13	W	I	2	No unit	T	9
05 Feb 88 03:13:42	117	44	O	I	3	1/1-001	T	2
05 Feb 88 03:14:49	216	67	O	I	3	1/2-001	T	1

#### A.2.4 Unit State Initialization Table (USIT)

The Unit State table describes Opfor and Bluefor units at the beginning of the mission segment.

Element Name	Element Description	Units
UNIT	Unit Name	15 Char
LINU	Next Higher Line Unit	15 Char
STAU	Next Higher Statistical Unit	15 Char
UTYPE	Unit Type Code (See Section A.3)	1 Integer
SIDE	Force Code (O or B)	1 Char
ECHELON <sup>5</sup>	Echelon	3 Char

>range of u is usit  
>retrieve (u.all)

unit	linu	stau	utype	side	echelo
001	No unit	No unit	5	O	Reg
1-001	001	001	1	O	Bn
1/1-001	1-001	1-001	1	O	Co
2/1-001	1-001	1-001	2	O	Co
3/1-001	1-001	1-001	3	O	Co
2-001	001	001	2	O	Bn
1/2-001	2-001	2-001	1	O	Co
2/2-001	2-001	2-001	2	O	Co
3/2-001	2-001	2-001	3	O	Co
3-001	001	001	3	O	Bn
1/3-001	3-001	3-001	1	O	Co

#### A.2.5 Unit Type Table (UTT)

The Unit Type table contains information relating to unit organizations.

<sup>5</sup> Echelon will be Plt, Co, Bn, Bde/ Div, or Reg

Element Name	Element Description	Units
UTYPE <sup>6</sup>	Unit Type Code	1 Integer
SIDE	Unit Force (O or B)	1 Char
ECHOLON <sup>4</sup>	Echelon	3 Char
DESC	Unit Description	20 Char

>range of u is utt

>retrieve (u.all)

utype	side	echelo	desc
1	0	Plt	1st Platoon
2	0	Plt	2nd Platoon
3	0	Plt	3rd Platoon
4	0	Plt	4th Platoon
5	0	Plt	Anti-Tank
6	0	Plt	Engineer
7	0	Plt	Chemical
8	0	Plt	Armored Cavalry
9	0	Plt	ABN Infantry
10	0	Plt	Army Aviation
11	0	Plt	Air Cavalry

#### A.2.6 Unit State Update Table (USUT)

The Unit State Update table tracks changes to all units throughout the duration of the mission segment. Changes to a unit are infrequent, so this table usually has no entries in it.

Element Name	Element Description	Units
TIME	Date and Time of Update	20 Char
UNIT	Unit Name	20 Char
STAU	Next Higher Statistical Unit	20 Char
UTYPE <sup>5</sup>	Unit Type Code	1 Integer

>range of u is usut

>retrieve (u.all)

time	unit	stau	utype
-----	-----	-----	-----
-----	-----	-----	-----

End of Request - 0 Row

#### A.2.7 Player/ Vehicle/ Weapon Code Table (PVWT)

<sup>6</sup> A list of unit types is presented in section A.3.



The Weapon Code table defines a unique code for each weapon present on the battlefield. The codes allow correlation of MILES codes, vehicle types, and weapons. The PVWT is static; it doesn't change from database to database. A listing of the PVWT table is included as Section A.2.7.1.

Element Name	Element Description	Units
SIDE	Side Code O(pfor) or B(bluefor)	1 Char
PTYPE	Player Type Code	1 Integer
VEHICLE	Vehicle Description	15 Char
MILES	MILES Weapon Code	1 Integer
WEAPON	Weapon description	15 Char
IAMMO	Initial Ammunition Load (not used)	2 Integer

#### A.2.7.1 PVWT Table Listing

1> print pvwt

side	ptype	vehicle	miles	weapon	iammo
B		0 Undefined	0	Unknown	0
B		1 M60 A1/A3 Tank	12	105mm main gun	0
B		1 Abrams	16	120mm main gun	0
B		1 M60 A1/A3 Tank	27	Coax	0
B		1 M60 A1/A3 Tank	28	105mm (miss)	0
B		1 M60 A1/A3 Tank	29	Coax (miss)	0
B		2 APC	24	M2 Machine Gun	0
B		2 APC	29	M2 (miss)	0
B		3 APC	7	TOW	0
B		3 APC	31	TOW (miss)	0
B		4 Manpack	0	non weapon	0
B		5 Manpack	15	Viper	0
B		5 Manpack	28	Viper (miss)	0
B		6 Manpack	8	Dragon	0
B		7 Manpack	27	M-16 rifle	0
B		7 Manpack	29	M-16 (miss)	0
B		8 Manpack	27	M60 machine gun	0
B		8 Manpack	29	M60 (miss)	0
B		9 Manpad	26	Stinger	0
B		10 Vulcan	23	20mm	0
B		10 Vulcan	29	20mm (miss)	0
B		11 Radars (GSR)	0	non weapon	0
B		12 Jammer	0	non weapon	0
B		13 Collector	0	non weapon	0
B		14 Truck	0	non weapon	0
B		15 DIVAD (M730)	25	Chaparral	0
B		15 DIVAD (M730)	28	Chaparral (miss)	0
B		16 Mortar	4	4.2 inch	0
B		17 Mortar	4	81mm	0
B		18 SP Gun	0	175mm	0
B		19 SP Howitzer	18	8 inch	0
B		20 SP Howitzer	18	105mm	0

B	21	SP Howitzer	18	155mm	0
B	22	AH 1S (Heli.)	7	TOW	0
B	22	AH 1S (Heli.)	14	2.75" Rockets	0
B	22	AH 1S (Heli.)	23	20mm	0
B	22	AH 1S (Heli.)	29	2.75"/20mm miss	0
B	23	Fighter	23	30mm	0
B	23	Fighter	29	30mm (miss)	0
B	24	Bomber	20	Rockeye (CB)	0
B	25	Fighter/Bomber	0	Uninstrumented	0
B	26	Reconnaissance	0	non weapon	0
B	29	Bradley	7	TOW	0
B	29	Bradley	21	25mm	0
O	0	Undefined	0	Unknown	0
O	1	Tank (T-72)	10	125mm main gun	0
O	1	Tank (T-72)	27	M60 Machine gun	0
O	1	Tank (T-72)	28	125mm (miss)	0
O	1	Tank (T-72)	29	M60 (miss)	0
O	2	BMP	0	non weapon	0
O	3	BMP	3	Sagger	0
O	3	BMP	14	PKT (73mm)	0
O	3	BMP	28	PKT (73mm)	0
O	4	BMP	3	Sagger	0
O	5	BRDM	0	non weapon	0
O	6	BRDM	8	Sagger	0
O	7	ZSU-23-4	6	Radar Mode	0
O	7	ZSU-23-4	22	Visual Mode	0
O	7	ZSU-23-4	29	Weapon miss	0
O	8	SP Howitzer	18	122mm	0
O	8	SP Howitzer	28	122mm	0
O	9	Gun Howitzer	13	152mm	0
O	9	Gun Howitzer	28	152mm (miss)	0
O	10	Howitzer	13	152mm	0
O	10	Howitzer	28	152mm (miss)	0
O	11	Manpack	0	non weapon	0
O	12	Manpack	3	Sagger	0
O	13	Manpack	27	AK (M-16)	0
O	13	Manpack	29	AK (M-16) miss	0
O	14	Manpack	27	PKT (M-60)	0
O	14	Manpack	29	PKT (M-60)	0
O	15	Manpack	26	SA7	0
O	16	Jammer	0	non weapon	0
O	17	Collector	0	non weapon	0
O	18	Truck	0	non weapon	0
O	19	ADA	0	Uninstrumented	0
O	20	SA9	0	Uninstrumented	0
O	21	Mortar	16	120mm	0
O	22	Mortar	0	180mm	0
O	23	HIND-D	7	AT-6	0
O	23	HIND-D	14	57mm Rocket	0
O	23	HIND-D	23	30mm	0
O	24	Fighter	0	Uninstrumented	0
O	25	Bomber	0	Uninstrumented	0
O	26	Fighter/Bomber	0	Uninstrumented	0
O	27	Reconnaissance	0	non weapon	0
W	0	Video	0	non weapon	0

W		1 Controller		0 Controller gun		0
W		2 Firer Marker		0 non weapon		0
+-----+-----+-----+-----+-----+						

#### A.2.8 Firing Event Table (FET)

This table will maintain a time-ordered record of all legitimate firings recorded by the RDMS. The last column, ammo, is only updated when RDMS data is utilized to enhance the data, and is otherwise zero.

Element Name	Element Description	Units
-----	-----	-----
TIME	Date and Time of Fire Event	20 Char
PID	Player ID (Bumper Number)	3 Char
LPN	Logical Player Number	2 Integer
MILES	MILES Weapon Code (See PVWT)	1 Integer
X	Position location X coordinate	4 integer
Y	Position location Y coordinate	4 integer
IAMMO	Ammunition Remaining	4 Integer

1> print fet

fet table

time	pid	lpn	miles	x	y	ammo
-----	-----	-----	-----	-----	-----	-----
30-Nov-89 07:33:32	C66	180	27	22075	123888	0
30-Nov-89 07:34:09	SC1	310	21	35538	118138	0
30-Nov-89 07:34:17	SC1	310	21	35538	118138	0
30-Nov-89 07:34:23	SC1	310	21	35538	118138	0
30-Nov-89 07:34:25	SC1	310	21	35538	118138	0
30-Nov-89 07:34:53	23B	363	21	36650	115175	0
30-Nov-89 07:36:27	23B	363	21	36650	115175	0
30-Nov-89 07:36:29	23B	363	21	36650	115175	0
30-Nov-89 07:38:07	23B	363	21	34525	117613	0
30-Nov-89 07:38:09	23B	363	21	34525	117613	0
30-Nov-89 07:38:19	SC6	315	21	28838	116350	0
30-Nov-89 07:38:59	23B	363	21	34525	117613	0
30-Nov-89 07:39:13	SC6	315	21	28838	116350	0

#### A.2.9 Pairing Event Table (PET)

The Pairing table will maintain a time-ordered record of legitimate pairing events. This table will also contain information relating to the firer if the pairing event can be matched with a fire event.

Element Name	Element Description	Units
-----	-----	-----
TIME	Date and Time of Pairing	20 Char

TPID	Target ID (Bumper Number)	3 Char
TLPN	Target LPN	2 Integer
RESULT	N(ear miss), H(it), K(ill)	1 Char
FPID	Firer ID (Bumper Number)	3 Char
FLPN	Firer LPN	2 Integer
MILES	Firer Weapon Type (MILES - See PVWT)	1 Integer
FRAT	Fratricide Indicator (Y/N)	1 Char
TX	Target position location X coordinate	4 Integer
TY	Target position location Y coordinate	4 Integer
FX	Firer position location X coordinate	4 Integer
FY	Firer position location Y coordinate	4 Integer

1> print pet

pet table

time	tpid	tlpn	result	fpid	flpn	miles	frat	tx	ty	fx	fy	dist
30-Nov-89 07:43:45	60A		339 H			0	0 N	32238	114550		0	0
30-Nov-89 07:43:53	B34		368 H			0	0 N	32400	118038		0	0
30-Nov-89 07:44:18	B34		368 N			0	0 N	32138	118138		0	0
30-Nov-89 07:44:30	D24		394 N			0	0 N	28450	116638		0	0
30-Nov-89 07:46:45	A16		98 N			0	0 N	21863	124638		0	0
30-Nov-89 07:47:45	A65		85 H			0	0 N	21750	124638		0	0
30-Nov-89 07:52:15	23B		363 K	B34	368	12 Y		29213	119988	31150	118463	2465
30-Nov-89 07:54:34	B60		354 K			0	0 N	29350	120725		0	0
30-Nov-89 07:55:59	330		215 N			0	0 N	22450	124188		0	0
30-Nov-89 07:56:32	313		185 H			0	0 N	22863	124225		0	0
30-Nov-89 07:57:12	32A		352 K			0	0 N	29900	115650		0	0
30-Nov-89 07:57:26	B11		357 N			0	0 N	29275	121950		0	0
30-Nov-89 07:57:30	C13		374 H			0	0 N	36325	115538		0	0

#### A.2.10 Communication Table (CT)

This table will maintain a record of all commo events (Key Depressed/ Released) for the mission segment.

Element Name	Element Description	Units
TIME	Date and Time of Commo Event	20 Char
PID	Player ID (Bumper Number)	3 Char
LPN	LPN	2 Integer
NET	Radio Net (1 or 2)	1 Char
Duration	Duration of transmission in MM:SS	5 Char

1> print ct

ct table

time	pid	lpn	net	durati
30-Nov-89 08:04:06	FD2	268	1	02:22
30-Nov-89 09:45:37	B60	354	2	49:38

```
| 30-Nov-89 09:53:41 |SC6 | 315|2 |27:53 |
+-----+-----+-----+-----+
```

(3 rows)  
End of Request

#### A.2.11 Ground Player Position Location Table (GPLT)

This table will maintain a time-ordered record of Position location (PL) X and Y coordinates for each instrumented ground player. PL will be recorded at an operator-selected interval.

Element Name	Element Description	Units
TIME	Date and Time of PL	20 Char
PID	Player ID (Bumper Number)	3 Char
LPN	LPN	2 Integer
X	Position location X coordinate	4 Integer
Y	Position location Y coordinate	4 Integer

1> print gplt

gplt table

```
+-----+-----+-----+-----+
|time          |pid  |lpn  |x          |y          |
+-----+-----+-----+-----+
| 30-Nov-89 07:37:14 |21B  |    1 |    35413 |    117700 |
| 30-Nov-89 07:37:14 |21E  |    2 |    32463 |    114450 |
| 30-Nov-89 07:37:14 |21G  |    4 |    32738 |    112813 |
| 30-Nov-89 07:37:14 |21H  |    5 |    37975 |    111825 |
| 30-Nov-89 07:37:14 |21J  |    7 |    28638 |    102413 |
| 30-Nov-89 07:37:14 |21L  |    9 |    35363 |    111375 |
| 30-Nov-89 07:37:14 |21M  |   10 |    37900 |    114050 |
| 30-Nov-89 07:37:14 |21N  |   11 |    34163 |    113900 |
| 30-Nov-89 07:37:14 |21P  |   12 |    36463 |    108088 |
| 30-Nov-89 07:37:14 |21Q  |   13 |    33438 |    117475 |
| 30-Nov-89 07:37:14 |21S  |   15 |    33813 |    120500 |
| 30-Nov-89 07:37:14 |21U  |   17 |    39488 |    113725 |
| 30-Nov-89 07:37:14 |21W  |   19 |    35250 |    116338 |
+-----+-----+-----+-----+
```

#### A.2.12 Air Player Position location Table (APLT)

This table will maintain a time-ordered record of Position location (PL) X Y, and Z coordinates for each instrumented air player. PL will be recorded at operator-selected intervals.

Element Name	Element Description	Units
TIME	Date and Time of PL	20 Char
PID	Player ID (Bumper Number)	3 Char
LPN	LPN	2 Integer

X	Position location X coordinate	4 Integer
Y	Position location Y coordinate	4 Integer
Z	Position location Y coordinate	4 Integer

1> print aplt

aplt table

time	pid	lpn	x	y	z
30-Nov-89 07:37:14	RA2	23	33150	117388	1662
30-Nov-89 07:37:14	OH1	275	26713	99863	0
30-Nov-89 07:37:14	AH1	279	21225	96625	1537
30-Nov-89 07:37:14	AH2	280	41575	108800	750
30-Nov-89 07:37:14	OV1	281	41550	108888	400
30-Nov-89 07:37:14	OV2	282	21225	96563	0
30-Nov-89 07:37:14	AV1	284	58238	115388	737
30-Nov-89 07:42:14	OH1	275	26713	99863	0
30-Nov-89 07:42:14	AH1	279	21050	96800	700
30-Nov-89 07:42:14	AH2	280	38925	109838	1050
30-Nov-89 07:42:14	OV1	281	35625	108525	550
30-Nov-89 07:42:14	OV2	282	21225	96563	0
30-Nov-89 07:42:14	AV1	284	58225	115388	700

#### A.2.13 Indirect Fire Casualty Assessment (IFCAS) Target Table (IFTT)

This table will contain a list of pre-planned indirect fire (IFCAS) targets and their locations.

Element Name	Element Description	Units
TARGET	IFCAS Target Name	5 Char
SIDE	Side (O or B)	1 Char
TGT_IDX	Target Index	2 Integer
X	Position location X coordinate	4 Integer
Y	Position location Y coordinate	4 Integer

>range of i is iftt

>retrieve (i.all)

target	side	tgt_id	x	y
055	B	1	52800	98300
056	B	2	53300	97800
057	B	3	45100	106800
058	B	4	44800	107000
	B	5	46200	98700
	B	6	50100	99900
2	B	7	46400	98400
	B	8	54400	104400
3	B	9	54400	100400

	B	10	55300	100800
4	B	11	55300	100800
118	B	12	54800	120000

#### A.2.14 IFCAS Target Group Table (IFGT)

This table will contain a list of pre-planned IFCAS target groups and their component targets.

Element Name	Element Description	Units
GROUP	IFCAS Target Group Name	3 Char
SIDE	Side (O or B)	1 Char
TARGET1	IFCAS Target Name #1	2 Integer
TARGET2	IFCAS Target Name #2	2 Integer
TARGET3	IFCAS Target Name #3	2 Integer
	O	
	O	
	O	
	(Up to 10 Targets)	

1> print ifgt

ifgt table

group	side	target	target	target	target	target	target	target	target	target	target	target
Y1A	O	10	11	0	0	0	0	0	0	0	0	0
Y1B	O	12	13	0	0	0	0	0	0	0	0	0
Y1C	O	14	15	0	0	0	0	0	0	0	0	0
Y1D	O	16	17	0	0	0	0	0	0	0	0	0
Y1E	O	18	19	0	0	0	0	0	0	0	0	0
Y1F	O	20	21	0	0	0	0	0	0	0	0	0
F6W	O	22	23	0	0	0	0	0	0	0	0	0
F6Z	O	24	25	0	0	0	0	0	0	0	0	0
F8	O	26	27	28	0	0	0	0	0	0	0	0
F8A	O	29	30	31	0	0	0	0	0	0	0	0
HT	O	32	33	34	0	0	0	0	0	0	0	0
Y2	O	35	36	37	0	0	0	0	0	0	0	0
Y2W	O	38	39	0	0	0	0	0	0	0	0	0

#### A.2.15 IFCAS Missions Fired Table (IFMF)

This table contains a list of all IFCAS missions fired during this mission segment. The elements present in this table are determined by how the data are specified. For instance, an IFCAS mission can be specified either by using a preplanned mission number or a service request. If a service request is specified, the target location can be given either by using a target group name or target coordinates.

Element Name	Element Description	Units
TIME	Date and Time of IFCAS mission	20 Char
FM	IFCAS Preplanned Mission Number	5 Char
SIDE	Force Code (O or B)	1 Char
ORG	Battery Identifiy	20 Char
TARGET	IFCAS Target Group Name	5 Char
X	IFCAS Target X coordinate	4 Integer
Y	IFCAS Target Y coordinate	4 Integer
MILES	IFCAS Weapon type code	1 Integer
SHELL	Shell Type Code	2 Char
FUSE	Fuse Type Code	2 Char

1> print ifmf

ifmf table

time	ifm	side	org	target	x	y	miles	shell	fuse
30-Nov-89 07:38:18	13	B	DA1	D1	36500	80000	18	DP	VT
30-Nov-89 07:54:00	14	O	OA4 122MM SP	SMK1	32100	80000	18	HC	PD
30-Nov-89 07:58:00	15	O	OA4 122MM SP	SMK2	32500	80000	18	HC	VT
30-Nov-89 08:02:00	16	O	OA4 122MM SP	SMK3	33100	80000	18	HC	VT
30-Nov-89 08:06:00	17	O	OA4 122MM SP	SMK4	31000	80000	18	HC	VT
30-Nov-89 08:11:35	20	O	OA4 122MM SP	1	29300	80000	18	HE	PD
30-Nov-89 08:16:14	23	O	OA5 122MM SP	SMK6	32100	80000	18	HC	VT
30-Nov-89 08:17:00	21	O	OA2 152MM SP	9F4	29400	80000	13	FA	VT
30-Nov-89 08:20:55	25	O	OA4 122MM SP	2	29400	80000	18	HE	PD
30-Nov-89 08:25:14	28	O	OA4 122MM SP	3	29400	80000	18	HE	PD
30-Nov-89 08:30:00	29	O	OA2 152MM SP	9F7	32900	80000	13	FA	VT
30-Nov-89 08:32:13	31	B	DB1	2	36700	80000	18	DP	VT
30-Nov-89 08:43:09	33	B	DA1	3	29400	80000	18	DP	VT

#### A.2.16 IFCAS Casualties Table (IFCT)

This table contains a list of all casualties assessed as a result of IFCAS missions fired during this mission segment.

Element Name	Element Description	Units
TIME	Date and Time of IFCAS mission	20 Char
FM	IFCAS Mission ID	5 Char
SIDE	Force Code (O or B)	1 Char
PID	ID of player killed by IFCAS	3 Char
LPN	LPN of player killed by IFCAS	2 Integer
X	Target position location X coordinate	4 Integer
Y	Target position location Y coordinate	4 Integer



1> print ifct

ifct table

time	fm	side	pid	lpn	x	y	
30-Nov-89 09:03:25	46	0	314	186	34750	117863	

(1 row)

End of Request

#### A.2.17 Minefield Casualties Table (MCT)

This table contains a list of all casualties assessed as a result of minefields during this mission segment.

Element Name	Element Description	Units
TIME	Date and Time of minefield casualty	20 Char
PID	ID of player killed by minefield	3 Char
LPN	LPN of player killed by minefield	2 Integer
X	Target position location X coordinate	4 Integer
Y	Target position location Y coordinate	4 Integer

>range of m is mct

>retrieve (m.all)

time	pid	lpn	x	y	

End of Request - 0 Row

#### A.2.18 Control Measure Table (CM)

The Control Measure Table contains a list of all initial control measures and control measures added or deleted during the mission segment.

Element Name	Element Description	Units
TIME	Date and Time Control Measure Added	20 Char
CM_IDX	index of control measure (1 - 200)	2 Integer
SIDE	(B)lue, (O)pfor, (W)hite	1 Char
STATE	(I)nitial, (A)dd or (D)elete	1 Char
STATUS	(C)urrent or (P)roposed	1 Char
OPSYS <sup>7</sup>	Operating System Code:	3 Char
ECHELON	Echelon code :	3 Char
CMTYPE <sup>8</sup>	Control Measure Type	1 Char
PURPOSE	Purpose (See A.4)	10 Char
POINTS	Number of points used	1 Integer
X1	X coordinate, point 1	4 Integer
Y1	Y coordinate, point 1	4 Integer
X2	X coordinate, point 2	4 Integer
Y2	Y coordinate, point 2	4 Integer
X3	X coordinate, point 3	4 Integer
Y3	Y coordinate, point 3	4 Integer

O

O

O

(Up to 12 Points)

1> print cm

cm table

time	cm_idx	side	state	status	opsys	ech	cmtyp	purpose	point	x1	y1	x12	y12
30-Nov-89 07:32:14	2	B	I	C		Bde	L	basic line	11	62750	112000	80000	70000
30-Nov-89 07:32:14	3	B	I	P	M/C	Bde	L	basic line	10	36550	119825	80000	70000
30-Nov-89 07:32:14	4	B	I	P	M/C	Bde	A	basic area	4	32475	122250	80000	70000
30-Nov-89 07:32:14	5	B	I	C	M/C	Bde	A	basic area	6	25850	122125	80000	70000
30-Nov-89 07:32:14	6	B	I	P	M/C	Bde	A	basic area	9	27300	124000	80000	70000
30-Nov-89 07:32:14	7	B	I	C	M/C	Bde	A	basic area	11	55850	119775	80000	70000
30-Nov-89 07:32:14	8	B	I	C	M/C	Bde	L	basic area	5	48775	112500	80000	70000
30-Nov-89 07:32:14	9	B	I	C	M/C	Bde	L	phase line	6	30000	127000	80000	70000
30-Nov-89 07:32:14	10	B	I	C	M/C	Bde	L	phase line	9	9825	128175	80000	70000
30-Nov-89 07:32:14	11	B	I	C	M/C	Bde	L	phase line	8	41750	122000	80000	70000
30-Nov-89 07:32:14	12	B	I	P	M/C	Bde	L	basic line	12	31425	116700	31250	114850
30-Nov-89 07:32:14	13	B	I	P	M/C	Bde	A	basic area	4	29750	116620	80000	70000

<sup>7</sup>Mnv - Manuever; FS - Fire Support; CSS - Combat Service Support; Int - Intelligence; ADA - Air Defense; M/C - Mobility/Counter mobility; n/c Not Specified;

<sup>8</sup>Point (P), Line (L) or Area (A).

### A.3 Unit Type Descriptions

#### RED UNIT TYPES

Code	Platoon	Company	Battalion	Regiment
0	1st	1st	1st	TOC
1	2nd	2nd	2nd	AT
2	3rd	3rd	3rd	Artillery
3	4th	4th	TOC	Trans
4	AT	1st Hq	AT	MRR 1
5	Engineers	2nd Hq	Artillery	MRR2
6	Chemical	3rd Hq	Engineers	-
7	Armored Cav	4th Hq	Chemical	-
8	ABN Infantry	Recon	Armored Cav	-
9	Army Aviation	AT	ABN Infantry	-
10	Air Cav	Artillery	Army Aviation	-
11	Commo	Engineers	Air Cav	-
12	TNSP	Chemical	Commo	-
13	Medical	Armored Cav	TNSP	-
14	EW	S&S	Army Aviation	-
15	S&S	Army Aviation	EW	-
16	ADA	Air Cav	S&S	-
17	-	Commo	ADA	-
18	-	TNSP	-	-
19	-	Medical	-	-
20	-	EW	-	-
21	-	S&S	-	-
22	-	ADA Battery	-	-

#### BLUE UNIT TYPES

Code	Platoon	Company	Battalion	Div/ Bde
0	1st	A Co	1st	TOC
1	2nd	B Co	2nd	TRNS
2	3rd	C Co	3rd	-
3	4th	D Co	4th	-
4	AT	CP Co A	5th	-
5	Mortar	CP Co B	6th	-
6	FIST	CP Co C	7th	-
7	Scout	CP Co D	TOC	-
8	4.2	Artillery	Combat Trans	-
9	Manpad	Engineers	Field Trans	-
10	Engineers	Chemical	Artillery	-
11	Chemical	Armored Cav	Engineers	-
12	Armored Cav	ABN Infantry	Chemical	-
13	ABN Infantry	Army Aviation	Armored Cav	-
14	Army Aviation	Air Cav	ABN Infantry	-
15	Air Cavalry	Commo	Army Aviation	-
16	Commo	TNSP	Air Cavalry	-
17	TNSP	Medical	Commo	-
18	Medical	EW	TNSP	-
19	EW	S&S	Medical	-
20	S&S	DIVAD	EW	-
21	DIVAD	-	S&S	-
22	-	-	DIVAD	-

#### A.4 Control measure purpose descriptions.

check pt - check point  
coordinat - coordination point  
start pt - start point  
release pt- release point  
passage pt- passage point (minefield)  
depart pt - departure point  
remote sen- remote sensor  
p-p target- pre-planned target point  
basic line- basic line (used to draw numerous figures)  
axis of ad- axis of advance  
phase line- phase line  
tank ditch- tank ditch  
concertina- concertina wire  
dir atk rt- direct attack route  
boundary - sector boundary  
trace FEBA- trace Forward Edge of the Battle Area  
FEBA - Forward Edge of the Battle Area  
limit adv - Limit of advance  
departure - departure line  
LD / LC - Line of Departure / Line of Contact  
prob deploy- Probable line of deployment  
FSCL - Fire Support Coordination Line  
RFL - Restrictive Fire Line  
CFL - Coordinated fire line  
MSR - Main Supply Route  
basic area- basic area (used for multiple shapes)  
operation - area of operations  
assembly - assembly area  
attack pos- attack position area  
drop zone - drop zone area  
fire suppt- fire support area  
landing zn- landing zone area  
FARP - Foreward Area Re-arm/Refuel point  
objective - objective area  
patrolbase- patrol base area  
pickup zn - pickup zone area  
scat mnfld- scatterable minefield  
support - support area  
group tgt - group target area  
RFA - Registered Fire Area  
non fire - non fire area  
contaminat- contaminated area  
battle pos- battle position area  
minefield - minefield area  
gap/bridge- gap / bridge area  
rad marker - radiation marker area  
passage - minefield passage area